

Appl. No. 10/010,911

Reply to Office Action of June 14, 2004

This listing of claims will replace all prior versions and listings in the above-identified application:

Claims 1-39 (canceled)

Claim 40 (withdrawn) A method of conducting current within a body, comprising the steps of:

inserting a transmissive device into the body, the transmissive device comprising a catheter with a lumen and a flexible coaxial cable in the lumen, operatively coupled to a housing of the transmissive device, the coaxial cable having an outer diameter of three millimeters or less, wherein the cable is capable of conducting a voltage greater than or equal to 10 kilovolts without electrical discharge; and

applying a voltage greater than or equal to 10 kilovolts to the coaxial cable; wherein the transmissive device can be operated without electrical discharge.

Claims 41-46 (canceled)

Claim 47 (new). A transmissive device for insertion into a patient's cardiovascular system, comprising:

a catheter with a lumen, the catheter having a proximal portion and a distal portion;

an x-ray source at the catheter distal portion, the x-ray source having a vacuum chamber

defined by a chamber wall and containing an anode and cathode for generating an electrical field, the vacuum chamber having a diameter less than 3mm;

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an electrically insulating material positioned between the vacuum chamber wall and the anode at joints of the vacuum chamber wall;
a flexible coaxial cable in the lumen having a center conductor coupled to the anode and an external conductor; and
a conductive layer overlying a portion of the vacuum chamber coupling the cathode to the external conductor of the flexible coaxial cable.

Claim 48 (new). The device of claim 47 further comprising a biocompatible coating over the flexible coaxial cable.

Claim 49 (new). The device of claim 47 wherein the coaxial cable is capable of delivering a direct current voltage.

Claim 50 (new). The device of claim 47 wherein an electric field of approximately 20 keV/micron or less is applied across the anode and cathode to generate x-ray radiation and to prevent flashover.

Claim 51 (new). The device of claim 47 wherein the conductive layer is solder.

Claim 52 (new). The device of claim 47 wherein the x-ray source generates radiation in a range of 8-10 keV.

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Claim 53 (new). The device of claim 47 wherein the device further includes a housing protecting the x-ray source.

Claim 54 (new). The device of claim 53 wherein the housing is transmissive to x-rays and comprises boron nitride.

Claim 55 (new). A device for insertion into a patient's cardiovascular system, comprising:

a catheter with a lumen, the catheter having a proximal portion and a distal portion, the catheter distal portion including an x-ray source, the x-ray source includes a cathode and an anode operating with an electric field of 20 keV/micron or less to prevent flashover;

a housing for the x-ray source having a diameter of less than 3 millimeters; and

a flexible coaxial cable in the lumen and operably coupled to the x-ray source.

Claim 56 (new). The device of claim 55 wherein the housing is composed of isotropic boron nitride.

Claim 57 (new). The device of claim 55 wherein the housing is composed of anisotropic boron nitride.

Claim 58 (new). The device of claim 55 wherein the housing is composed of pyrolytic boron nitride.

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Claim 59 (new). The device of claim 55 wherein the composite structure is operative to produce x-ray radiation in a range of 8-10 keV.

Claim 60 (new). The device of claim 55 wherein the housing is transmissive to x-rays.